



## **Practical and innovative solutions to overcome language barriers in veterinary and animal science education in the European Union**

Vargas-Bello-Pérez, Einar; Hernández-Castellano, Lorenzo E.

*Published in:*  
Journal of Applied Animal Research

*DOI:*  
[10.1080/09712119.2019.1651728](https://doi.org/10.1080/09712119.2019.1651728)

*Publication date:*  
2019

*Document version*  
Publisher's PDF, also known as Version of record

*Document license:*  
[CC BY](#)

*Citation for published version (APA):*  
Vargas-Bello-Pérez, E., & Hernández-Castellano, L. E. (2019). Practical and innovative solutions to overcome language barriers in veterinary and animal science education in the European Union. *Journal of Applied Animal Research*, 47(1), 429-432. <https://doi.org/10.1080/09712119.2019.1651728>



## Practical and innovative solutions to overcome language barriers in veterinary and animal science education in the European Union

Einar Vargas-Bello-Pérez & Lorenzo E. Hernández-Castellano

To cite this article: Einar Vargas-Bello-Pérez & Lorenzo E. Hernández-Castellano (2019) Practical and innovative solutions to overcome language barriers in veterinary and animal science education in the European Union, Journal of Applied Animal Research, 47:1, 429-432, DOI: [10.1080/09712119.2019.1651728](https://doi.org/10.1080/09712119.2019.1651728)

To link to this article: <https://doi.org/10.1080/09712119.2019.1651728>



© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 07 Aug 2019.



Submit your article to this journal [↗](#)



Article views: 140



View related articles [↗](#)



View Crossmark data [↗](#)

REVIEW



## Practical and innovative solutions to overcome language barriers in veterinary and animal science education in the European Union

Einar Vargas-Bello-Pérez <sup>a</sup> and Lorenzo E. Hernández-Castellano <sup>b</sup>

<sup>a</sup>Department of Veterinary and Animal Sciences, Faculty of Health and Medical Sciences, University of Copenhagen Frederiksberg C, Denmark;

<sup>b</sup>Department of Animal Science, AU Foulum, Aarhus University, Tjele, Denmark

### ABSTRACT

Academic mobility and cultural diversity have continuously increased in higher education in recent years. Consequently, the language barrier has become an important issue in the learning process, mainly in Europe where there are 24 official languages. In animal and veterinary sciences, the complexity of vocabulary used during the learning process exacerbates this problem. To overcome this problem, lecturers must create an interactive and engaging classroom atmosphere, provide a reduced and concise lecture and promote interaction between students through the promotion of discussion. The use of e-tools also contributes to student interaction. When teaching animal biological processes, hands-on laboratory exercises and case-based activities also help overcome language barriers between students and lecturers. Lecturers need to create an interactive classroom through the use of direct and concise language and new technologies to promote learning in international classrooms.

### ARTICLE HISTORY

Received 29 March 2019

Accepted 31 July 2019

### KEYWORDS

Animal science; Europe; language barriers; education; veterinary medicine; international

### Introduction

Recently, higher education has become an important indicator of national economic competitiveness. Internationalization in higher education is commonly linked to the innovative response to external marketing opportunities (Kim 2009). Moreover, international recruitment of the best and most brilliant students and lecturers contributes to increased international recognition (Tripathi and Mukerji 2017). Consequently, academic mobility and cultural diversity have continuously increased in higher education institutions in recent years (Teichler 2015).

In the European Union (EU), several national policies have been developed to increase the mobility of students and lecturers and promote cooperation among European institutions; which led to the creation of the Bologna Declaration in 1999. This fact, together with liberalization of international higher education markets, enabled and stimulated the cross-border and free trade of educational services. Several studies have focused on student mobility in the EU (Aramburu 2017; Groves et al. 2018; McGrath and Frearson 2016). Similar studies on lecturers' mobility in the EU are limited. In some countries such as Austria, Denmark, the Netherlands or Belgium foreign lecturers can represent a high percentage of academic staff. For instance, Danish universities have been to increase the number of foreign lecturers over the last decade as part of the internationalization strategy (Forskningsministeriet U-o 2014). International academic staff represents nowadays 30% of the overall teaching staff, including Assistant Professors, Associate Professors and Full Professors at Danish universities. Similar strategies to increase the number of international

academic staff have been implemented at other European universities such as University of Tartu (Estonia, 12%), Wageningen University (The Netherlands, 13%), Ghent University (Belgium, 13%). However, these percentages are quite low compared to the percentage of international academic staff at the University of Austria (Austria), where they represent up to 70% of the total academic staff (information obtained from the reports published at each official university website).

According to Chugh (2017), the success of knowledge transfer in universities is often hampered by factors such as lack of resources, lack of peer trust, job insecurity, culture (personal and organizational), inadequate communication, lack of leadership, organizational politics and work overload. The negative effect of some of these factors (i.e. culture, inadequate communication, lack of leadership and work overload) on the success of knowledge transfer is often exacerbated by the use of a non-native language by lecturers or students (Henderson and Wellington 1998).

In the EU, there are 24 official languages, where only 13% of the total European population have English as the native language (Eurobarometer 2012). Soon, this percentage could be reduced if the United Kingdom leaves the EU. As shown in Table 1, in European universities located in countries where English is not the native language, English is often chosen as the language of teaching when either the students or the academic staff do not speak or understand the national language, especially at Masters level.

The role of the lecturer is not only to transfer information, but also facilitate development of students' ability to apply basic knowledge and gain higher levels of understanding

**Table 1.** Top 10 European universities in veterinary and animal science education<sup>a</sup> according to the 2019 Times Higher Education World University Rankings.

University	Country	Number of students per staff	International students (%)	Teaching language <sup>b</sup>	
				Bachelor	Master
LMU Munich	Germany	36.0	16	German (100%)	German (100%)
Wageningen University	Netherlands	20.9	29	Dutch (85%) English (15%)	English (100%)
Utrecht University	Netherlands	14.3	7	Dutch (100%)	Dutch (100%)
University of Helsinki	Finland	16.6	6	Finnish (100%)	English (100%)
Free University of Berlin	Germany	56.4	21	German (100%)	German (100%)
University of Copenhagen	Denmark	4.4	16	Danish (100%)	English (100%)
Aarhus University	Denmark	14.8	11	Danish (100%)	English (100%)
Catholic University of Louvain	Belgium	39.6	21	English (100%)	English (100%)
Ghent University	Belgium	35.2	10	Dutch (100%)	Dutch (100%)
Autonomous University of Barcelona	Spain	12.8	16	Spanish (30%) Catalan (69%) English (1%)	Spanish (50%) English (50%)

<sup>a</sup>Excluding European universities located in countries where English is the official language (i.e. UK, Ireland)

<sup>b</sup>Information obtained from the official website of each University.

(Kaisarevic et al. 2017). To accomplish these goals, lecturers must become facilitators who create a learning environment in which questioning, seeking, synthesizing, and discussing are encouraged (Fry et al. 2009). During didactic activities, interpersonal communication between lecturers and students should be orientated towards achieving educational objectives, through lecturers' ability to produce an effect on students and organize learning activities. The issue of didactic communication and lecturers' communication competence are subjects treated in numerous specialty papers, from the field of communication sciences to the field of psycho-pedagogy (Crista 2018). Therefore, the use of English by non-native English lecturers to teach non-English native students (e.g. native Spanish lecturers use English to teach native Danish students) is an important issue to be addressed during the creation and organization of a subject. Thus, the language barrier can be exacerbated in the veterinary and animal science fields due to the complexity of vocabulary used during the learning process. For instance, the use of either technical words (i.e. methylenedioxymethamphetamine, depolarizability, gluconeogenesis), words rarely used in English (i.e. aliquot, supernatant, centrifuge, rumination) or technical concepts (i.e. fresh cow, dry cow, white veal) can challenge the transfer of knowledge from lecturers to students. Therefore, lecturers must develop practical and innovative educational strategies to overcome language barriers and provide a clear transparent flow of knowledge to their students. In this article, we suggest practical and innovative ways to solve linguistic problems between lecturers and students to promote the transfer of knowledge in European Universities.

### Creation of an interactive and engaging classroom atmosphere

The creation of an environment that invites and encourage students to participate and contribute to their own learning is essential (Croese 2011). This situation can be affected when the teaching language is different from the mother tongue of either the lecturer or the student. Language affects students' ability to understand, interact and learn with direct consequences on students' confidence (Ramburuth and Tani 2009).

Therefore, it is recommended that lecturers and students spend some time at the onset of the academic course to identify cultural similarities and differences, which will contribute substantially to the creation of an interactive and engaging classroom atmosphere (Devita 2000). Additionally, the creation of peer-pairing programmes for either lecturers or students can help overcome language barriers in a classroom. In this type of programme, international and national lecturers work together to facilitate understanding from both sides. This strategy is not only helpful for the international lecturer or student, but also for the host (Summers and Volet 2008). The host partner can help the international partner be familiarized with new environmental conditions (i.e. campus resources, lifestyles, official requested documents, grading system). On the other hand, this strategy could help the host in the future, if needing to work with a multicultural and multidisciplinary group of people (i.e. working for global enterprises).

### Reduced and concise one-way communication, increased understanding and learning

In an international classroom, both lecturers and students need to work together to overcome language barriers. Lecturers need to understand the use of non-specific terms such as metaphors, double meaning expressions or ambiguous expressions might cause misunderstanding in students (Jha 2017). Therefore, lectures should teach in a clear, slow, direct and concise way to facilitate student comprehension (Devita 2000; Ramburuth and Tani 2009). Additionally, lecturers should use body language to emphasize important statements (Teekens 2003). For example, exaggerated body movements, change of body posture or gestures can attract students' attention to important concepts they will need to keep in mind for future discussions.

Lecture duration also affects attention level of students, particularly when lectures consist of long monologues (Song et al. 2019). This factor is even more important in an international classroom because students can suffer from language fatigue in the process of understanding what is being said, which further challenges them in their understanding of the topic (Devita 2000). Therefore, lectures based on monologues must be limited to short time periods and more learner-centred

activities should be promoted in the classroom. As students engage in more active learning in classrooms, their reliance upon understanding the spoken word is decreased (Croze 2011). Learner-centred activities minimize language barriers and increase student learning (Devita 2000; Halic et al. 2009).

### Increased classroom interaction through the promotion of discussions

As part of learning science, it is important for students to explore their own views and those of others to develop an independent way of thinking (Henderson and Wellington 1998). Lecturers must promote listening and talking between students, which in turn will increase constructive discussions and generation of new ideas in the classroom (Biggs 2012). However, due to cultural differences, language barriers, and cultural norms, participation in an international classroom is frequently lower than classrooms where lecturers and students share the same language (Leask 2009). Lack of participation can put additional distance between international students or between students and the lecturers, leading to increased cultural distance.

Several authors have described diverse strategies aimed at facilitating effective discussions in an international classroom. One of these strategies is based on using reduced (three or four people) multicultural groups for discussion activities. Those groups are intended to promote participation of students with language difficulties because they are less worried about expressing themselves incorrectly (grammar mistakes, wrong words) (Croze 2011). Therefore, this strategy does not only generate valuable discussions among group members; it also improves the communication skills of those with some difficulties. When these small groups are created, lecturers must ensure connections among groups to promote global discussion. Another strategy to promote classroom discussion is for lecturers to suggest some discussion topics in advance (e.g. upload topics in a virtual campus one week before class), so students can prepare some comments and answers in advance, which will increase student confidence and therefore participation in discussions (Macgregor and Folinazzo 2018). In both strategies, lecturers should acknowledge the new concepts or insights introduced by the student, so they can feel more comfortable participating in future discussions (Devita 2000).

The use of new technologies is another novel strategy to improve communication and interaction between students and lecturers; e-tools such as Glogster, Kahoot and Spreaker are examples (Serdyukov 2017). Electronic polling and quiz tools (i.e. Poll Everywhere, Socrative, and Kahoot) are alternatives to classroom response systems such as clickers. Lecturers can use polls or online/mobile quizzes to engage students throughout a discussion, keep track of attendance, and assess comprehension and attitudes of the group (Glendon and Ulrich 2005). Students can also compete in games in groups or alone for points. In the case of veterinary medicine teaching, polls or quizzes can be used for discussing case studies where students argue the diagnosis for a given clinical sign.

Another interesting option is to use digital game-based learning adapted to specific animal science concepts or veterinary medicine activities (Buur et al. 2013). For example, one of the

most important basic processes to understand in animal science is the production stages of a cow. In this case, a digital game-based tool will help students to actively understand how cows change their physiological needs as production stages progress. When students are taught with a simple PowerPoint slide, concepts may not be fully understood, which will lead to subsequent misunderstandings in advanced courses (Schmaltz and Enström 2014) such as animal nutrition, animal physiology or animal endocrinology. Consequently, a digital game where students can fill out a diagram with real images and keywords of a cow's production cycle will help greatly.

New technologies to improve learning and instruction are not intended to replace masterful teaching, but to complement it. In addition, given that 'millennial' students are digital natives and most lecturers are digital immigrants, a modern lecturer should be a learning designer rather than just the content expert and creator of a syllabus and PowerPoint slides (Lee et al. 2017).

### Assessment and evaluation based on the process are used to find the solution rather than the solution itself

Student assessment and evaluation should focus more on the method and process used to find a solution rather than the solution itself (Edmundson 2006). For instance, problem-based learning is a teaching method in which complex real-world problems are used to promote student learning of concepts and principles (Hmelo-Silver 2004). Additionally, this strategy can promote development of critical thinking skills, problem-solving abilities, and communication skills and provide opportunities for working in groups, finding and evaluating research materials, and life-long learning (Duch et al. 2001). However, lecturers must be cautious when they include these type of activities in a multicultural classroom. Cultural contexts and language barriers can cause misinterpretation of directions by students (Harzing and Feely 2008). In these cases, lecturers should clearly define tasks, so students can apply acquired skills and knowledge to reach a solution. This type of activity does not only allow students to demonstrate the processes used to arrive at the solution, but it lets students apply their knowledge to real situations and problems (Russell and Airasian 2011). In animal and veterinary sciences, problem-based learning is perhaps the most useful teaching method. In this case, we can use two ways of learning that balance each other: hands-on laboratory exercises (HLE) and case-based activities (CBA) (Mcfee et al. 2018). For example, in farm animal reproduction, students may study semen evaluation by HLE whereas in CBA students can learn specific parameters of a real case to understand estrous cycle manipulation and synchronization. As another example, when learning about the cardiovascular system, students can use electrocardiograms as HLE proxy and then use specific electrocardiograms from a real case as CBA. Both HLE and CBA should be implemented together. They are a very interesting choice of evaluation that helps overcome language barriers when teaching complex biological process. Animal science students and veterinary medicine students have different academic backgrounds (Reiling et al. 2003). However, both groups of students need to achieve a

cognitive level where they are able to create arguments and diagnose, treat and conjecture about on-farm or in clinical situations needing a solution.

## Conclusion and recommendations

This manuscript described different examples of teaching strategies that can be used in veterinary and animal science education to overcome language barriers and contribute to the creation of an interactive and engaging classroom atmosphere. The use of digital tools such as electronic polling and quiz tools is recommended to promote student interaction. In addition, hands-on laboratory exercises and case-based activities help overcome language barriers between students and lecturers when teaching complex biological process.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## ORCID

Einar Vargas-Bello-Pérez  <http://orcid.org/0000-0001-7105-5752>

Lorenzo E. Hernández-Castellano  <http://orcid.org/0000-0003-2729-0434>

## References

- Aramburu L. 2017. Intra-European student mobility in international higher education circuits: Europe on the move. *Int Sociol.* 32:252–255.
- Biggs J. 2012. What the student does: teaching for enhanced learning. *High Educ Res Dev.* 31:39–55.
- Buur JL, Schmidt PL, Barr MC. 2013. Using educational games to engage students in veterinary basic sciences. *J Vet Med Edu.* 40:278–281.
- Chugh R. 2017. Barriers and enablers of tacit knowledge transfer in Australian higher education institutions. *Int J Edu Learn Syst.* 2:272–276.
- Crista NG. 2018. Considerations regarding didactic communication in veterinary and agricultural higher education research. *Res J Agri Sci.* 50:26–31.
- Croze B. 2011. Internationalization of the higher education classroom: strategies to facilitate intercultural learning and academic success. *Int J Teach Learn Higher Edu.* 23:388–395.
- Devita G. 2000. Inclusive approaches to effective communication and active participation in the multicultural classroom: an international business management context. *Act Learn Higher Edu.* 1:168–180.
- Duch BJ, Groh SE, Allen DE. 2001. The power of problem-based learning: a practical 'how to' for teaching undergraduate courses in any discipline. Virginia: Stylus Pub.
- Edmundson A. 2006. Globalized e-learning cultural challenges. Arlington, VA, USA: Information Resources Press; p. 1–357.
- Eurobarometer. 2012. Special Eurobarometer 386: Europeans and their languages.
- Forskningsministeriet U-o. 2014. Status for opfyldelse af 60 og 25 pct. målsætningerne. Available from: <http://ufm.dk/uddannelse-og-institutioner/statistik-og-analyser/frafald-studietid-fuldforelse/bilag-1-status-for-opfyldelsen-af-60-og-25-pct-malsaetningerne.pdf>.
- Fry H, Ketteridge S, Marshall S. 2009. Handbook for teaching and learning in higher education. New York: Routledge.
- Glendon K, Ulrich D. 2005. Using games as a teaching strategy. *J Nurs Educ.* 44:338–339.
- Groves T, López EM, Carvalho T. 2018. The impact of international mobility as experienced by Spanish academics. *Eur J Higher Edu.* 8:83–98.
- Halic O, Greenberg K, Paulus T. 2009. Language and academic identity: a study of the experiences of non-native English speaking international students. *Int Educ.* 38:73–93.
- Harzing A-W, Feely AJ. 2008. The language barrier and its implications for HQ-subsidiary relationships. *Cross Cult Manag.* 15:49–61.
- Henderson J, Wellington J. 1998. Lowering the language barrier in learning and teaching science. *School Sci Rev.* 79:35–38.
- Hmelo-Silver CE. 2004. Problem-based learning: what and how do students learn? *Edu Psychol Rev.* 16:235–266.
- Jha S. 2017. Exploring ambiguous structure in English. *Glob J Interdis Soc Sci.* 6:1–4.
- Kaisarevic SN, Andric SA, Kostic TS. 2017. Teaching animal physiology: a 12-year experience transitioning from a classical to interactive approach with continual assessment and computer alternatives. *Adv Physiol Educ.* 41:405–414.
- Kim T. 2009. Transnational academic mobility, internationalization and interculturality in higher education. *Intercul Educ.* 20:395–405.
- Leask B. 2009. Using formal and informal curricula to improve interactions between home and international students. *J Stud Int Edu.* 13:205–221.
- Lee J, Lim C, Kim H. 2017. Development of an instructional design model for flipped learning in higher education. *Edu Tech Res.* 65:427–453.
- Macgregor A, Folinazzo G. 2018. Best practices in teaching international students in higher education: issues and strategies. *Tesol J.* 9:299–329.
- Mcfee RM, Cupp AS, Wood JR. 2018. Use of case-based or hands-on laboratory exercises with physiology lectures improves knowledge retention, but veterinary medicine students prefer case-based activities. *Adv Physiol Educ.* 42:182–191.
- McGrath CH, Frearson M. 2016. Admission systems and student mobility: a proposal for an EU-wide registry for university admission. *Foro Educ.* 14:167–195.
- Ramburuth P, Tani M. 2009. The impact of culture on learning: exploring student perceptions. *Multicul Edu Tech J.* 3:182–195.
- Reiling BA, Marshall TT, Brendemuhl JH, McQuagge JA, Umphrey JE. 2003. Experiential learning in the animal sciences: development of a multispecies large-animal management and production practicum. *J Anim Sci.* 81:3202–3210.
- Russell MK, Airasian PW. 2011. Classroom assessment: concepts and applications. Dubuque, IA: McGraw-Hill.
- Schmaltz RM, Enström R. 2014. Death to weak PowerPoint: strategies to create effective visual presentations. *Front Psychol.* 5:1138.
- Serdyukov P. 2017. Innovation in education: what works, what doesn't, and what to do about it? *J Res Innov Teach Learn.* 10:4–33.
- Song Y, Chen XL, Hao TY, Liu ZN, Lan ZX. 2019. Exploring two decades of research on classroom dialogue by using bibliometric analysis. *Comput Educ.* 137:12–31.
- Summers M, Volet S. 2008. Students' attitudes towards culturally mixed groups on international campuses: impact of participation in diverse and non-diverse groups. *Stud High Educ.* 33:357–370.
- Teekens H. 2003. The requirement to develop specific skills for teaching in an intercultural setting. *J Stud Int Educ.* 7:108–119.
- Teichler U. 2015. Higher education research in Europe. In: Curaj A, Matei L, Pricopie R, Salmi J, Scott P, editors. The European higher education area: between critical reflections and future policies. Cham: Springer International Publishing. p. 815–847.
- Tripathi P, Mukerji S. 2017. Handbook of research on technology-centric strategies for higher education administration. Pennsylvania: IGI Global.